VOLUME 1 - NO. 7 OCTOBER 1993

The Low Band Monitor

CQWWDX Contest Special

The 1992 CQWWDX Contest results for both the Phone and CW weekends have been released in recent issues of *CQ Magazine*. Lots of good scores and excellent band conditions were enjoyed by thousands. We will look at the results from a low band perspective in this issue of the *Low Band Monitor* and recognize the top 25 stations in each low band category.

Even if you do not like DX contests, the CQWW results can tell us a number of things about propagation, that can be applied to general DXing.

The CQWWDX Contest has been going through some major changes in the past few years. The advent of packet spotting networks, digital voice keyers, computerized logging and other innovations have radically changed the event from the days when the late W4KFC and W3GRF used to slug it out.

The all band entrants and the multi-operator classes are dealing with a much higher level of complexity than anyone ever imagined would be needed.

The last time I did a multi-operator operation we spent more time preparing a null modem cable than tweaking any RF device, including transceivers, amplifiers or antennas!

Low Band Monitor CQWWDX Planning Map Inside!

The low band DXer can approach this contest in a number of ways. You can enter the event like a sportsman and attempt to maximize your score, or you can cherry pick a number of bands, simply attempting to increase your country total.

My favorite entrants are the single operator - single band participants. These are the guys that are willing to commit an entire weekend to a single band and take their chances regardless of the propagation conditions.

The 40, 80 and 160 meter band entrants give us a true picture of low band propagation because there scores are not influenced by the constraints that all-band entrants must deal with.

The 10 minute rule for all-band entrants has always been a problem for the low band enthusiast and it is now compounded by typical computer software analysis that will tell the all-band entrant to "stay on 20 meters until the QSO rate drops below 37.4 per minute".

Scores in the low band categories however, continue to improve and should show a continued trend upward for the next few years.

80 Meter DXCC In 48 Hours!

We are now operating in an era where one-hundred countries are being worked in one weekend on the 80 meter band in this contest. In this issue we will look at the countries and zones worked lists of Multi-Multi station K1AR and Single Band station K1ZM, who have both dominated this event for a number of years.

K1AR, manned by K1MM and single-op K1ZM both managed to work over one-hundred countries in one weekend on the 80 meter band.

Look closely at the K1AR countries list. At first the countries worked entries don't impress you. It's the usual garden variety DX that we have all worked at one time or another. Then you realize that you are looking at the 80 meter column and remind yourself that this work was done under rather crowded band conditions and in perhaps 24 hours of prime operating time. It's truly an eye opener.

I am wondering where we are headed. We were not at the peak of low band conditions in 1992 and although the past years event was definitely a great year, you would think that one of the next five years could be even better!

Could someone work 100 countries on 160 meters in a weekend in the coming years? How about a 40 or 80 meter WAZ in one weekend?

The world economy is obviously down, but many of the cold war barriers that kept some of the more difficult parts of the world inaccessible and inactive, now no longer exist.

Today it would not be out of the question for someone from say Kansas City, Missouri to travel to Zone 18 for the CQWWCW Contest. A couple of fellows from the East Iowa DX Association could go to Zone 23 if they were so inclined.

I am not saying this would be trivial or inexpensive, only that it would not be impossible under the political conditions that exist in the world today.

The world today is obviously full of serious problems, but it is not beyond the realm of possibility to think about such achievements as a weekend 160 meter DXCC or a weekend 40 meter or 80 meter WAZ.

You are probably saying that it will never happen. You could indeed be correct, but did you ever think that anyone would ever work over 100 countries on 80 meters in one weekend? I have looked at every single page of results ever printed for this event and never thought that this barrier would be broken - ever.

I also thought that *Fingertips - Part I* would be Stevie Wonder's only hit, and that Beta was a good video format!

CQ Magazine reports that at least eight additional people worked one-hundred 80 meter countries in the 1992 CQWWDXCW Contest.

Stay tuned and see you in the pileups.

Lance Johnson - Editor

The CQWWDX Contests of 1992

The Top 25 Worldwide Low Band Scores SSB and CW - by K0CS

Editor's Note: The CQWWDX Contest low band results generally are a good barometer for measuring propagation conditions. The year 1992 provided excellent activity on the 40 and 80 meter bands and has provided us with a framework to measure opportunities in the 1993 event.

The top 25 low band scores for both modes of the 1992 CQWWDX Contest are presented here for comparison and goal setting purposes. These scores have been truncated to the nearest thousand and should give you a good feel for activity and band conditions on each band and mode.

Look closely at the balanced distribution of scores. In every category except 75 meter phone, where TI1C overwhelmed the competition, there was a real horse race. Throughbred I'm sure!

The depth of entrants on the 40 and 80 meter categories attests to the good world wide propagation found on these bands. The 160 meter entrants were game, but in 1992 it took great determination and a good book to keep your focus.

SCORE REQUIRED TO MAKE TOP 25 WORLDWIDE IN THE 1992 CQWWDX CONTEST

40M PH	40M CW	75M PH	80M CW	160M PH	160M CW
224K	267K	51K	117K	1K	13K

• **Forty Meters** - The forty meter band conditions in 1992 for both the CW and SSB modes will grade out as excellent by just about everyone. The 25th position on phone (JA2BAY) and CW (W4BQF) both managed an impressive 200 K points. That's a very imposing score by any standard.

Note that in both forty meter modes the first, second and third place scores were awarded to PJ9, ZF2 and S59.

ZF2TG and the late ZF2RJ made valiant 2-point QSO trys, but could not quite catch PJ9U and PJ9E in Zone 9.

If you thought that forty meters is just a CW band, look again. The SSB scores parallel the CW scores at just about every level. The forty meter phone category also attracted two rather rare entrants in the 10th (FR5DX) and 13th (TF3CW) positions, a nice surprise.

Notice the impressive efforts by V7MHZ (6th) on phone and VK6LW (14th) on CW. These are very impressive scores from the Pacific and attest to the great conditions.

If you were planning a world wide effort to win this one, I would recommend going to Jordan, JY. This is a 3 point contact into Europe and with good conditions, US and JA contacts can also be had.

Zone 9 entries are hard to beat on this (or any) band, but any Zone 20 entrant (close to Europe) would be very competitive. You might even be asked for a few QSL's.

Top 25 - 40 Meter Operators
1992 CQWW CONTEST
A Low Band Monitor Exclusive

40 METER PHONE			40 METER CW		
1	PJ9E	992	1	PJ9U	1171
2	ZF2RJ	917	2	ZF2TG	1087
3	S59UN	875	3	S59UN	971
4	FM5CD	776	4	K8PO	821
5	H21A	736	5	4N1Z	802
6	V7MHZ	680	6	W7XR	794
7	ZB2X	554	7	I3JSS	718
8	VD3CDX	501	8	K4XS	683
9	JA8IXM	487	9	OK3RM	682
10	FR5DX	485	10	KB0G	636
11	AM92KW	462	11	LY5R	598
12	YT7A	456	12	FM5BH	593
13	TF3CW	454	13	YL2KL	585
14	DL8OH	448	14	VK6LW	533
15	LU1IV	434	15	W2UP/3	521
16	TG9AJR	395	16	JH7PKU	513
17	F6EZV	393	17	OG7MA	495
18	RV0AR	377	18	K1UO	493
19	W7XR	363	19	W3GH	467
20	GI0KOW	346	20	N6RO	392
21	KC7EM	332	21	VE6JY	377
22	OG7MA	316	22	UL8JO	374
23	VO2ZP	299	23	JA0KAZ	307
24	K1UO	264	24	UL7BAY	277
25	JA2BAY	224	25	W4BQF	267

• **Eighty Meters** - The TI1C score on 75 meter SSB was simply awesome. It tends to bias the comparison of activity for each mode, but if you look at the total distribution of scores you will see that SSB yields 50 percent of the activity seen on CW.

K1ZM's win from the US is a noteworthy milestone, particularly when you notice that there was an entrant from CT3FN in Zone 33. Jeff was said to work a large number of Canadians during the day to combine with his impressive 100 plus country total.

This is what you have to do to win the world from the US.

Notice that the 25th place finisher world wide on 80 meter CW (KO0U) managed to easily break the 100K level. That's verification that the band was excellent, as 100K on the 80 meter band is truly a world class score by anyone's standards.

Seven stations from S5 made the top 25 in the 75 meter SSB category, with S51NA (8th in world) winning the spirited battle with his countrymen.

Can you imagine what the 75 meter band must have sounded like from Europe.

Split frequency operation is the standard SSB procedure now from Europe on 75 meters. You may need to buy a tuner or erect another antenna to handle the bandwidth.

V73C managed a credible score from the Pacific (9th in world) in the 80 meter CW portion, but participation was down in the 75 meter SSB mode.

The RF6FM (15th in world) effort on 75 meter phone probably made a lot of people happy worldwide as did the UF7FXC (22nd in world) entry on 80 meter CW.

The 6th place showing worldwide by W6RJ and 9th place finish by WE3C on 75 meter SSB are significant and indicate that a competitive score can be made from a US station not located on the east coast..

We see that K1ZM (3rd in world) also owns a microphone.

Top 25 - 80 Meter Operators
1992 CQWW CONTEST
A Low Band Monitor Exclusive

75 METER PHONE			80 METER CW		
1	TI1C	498	1	K1ZM	416
2	TM5C	286	2	G3KDB	360
3	K1ZM	223	3	OE3GSA	359
4	LY3BS	169	4	CT3FN	344
5	G3NAS	155	5	K1IU	315
6	W6RJ	140	6	SN3A	297
7	OH7UE	136	7	S59KAB	289
8	S51NA	135	8	W1MK	275
9	WE3C	125	9	V73C	274
10	YU5MRR	117	10	OK3TPV	245
11	4N9A	103	11	F2CW	237
12	S57AL	102	12	SM6MCW	221
13	W1GIH	96	13	OH7UE	218
14	S59KAB	93	14	PA3DFT	206
15	RF6FM	92	15	KT3Y	205
16	S52CD	90	16	OH2PM	174
17	S59DZD	86	17	OH2BCI	174
18	OK3NA	78	18	LY3BS	164
19	S59ZA	70	19	LY1DS	155
20	OK3PA	63	20	WE3C	153
21	KN6M/5	61	21	K0RF	139
22	S54ZZ	61	22	UF7FXC	136
23	SP5ZIM	55	23	I3VHU	134
24	LY1DS	53	24	F1NBX	118
25	KM0J	51	25	K00U	117

If you want to win the world on 75 or 80 meters next year, go to St Pierre, FP. You will be able to work the US and Canada all day long, and have a fine path into Europe. Some of you would prefer PJ, EA8, CT3 or even EA9, but the St. Pierre strategy is very sound for just about every propagation scenario.

• **One Hundred Sixty Meters** - A win for Zone 20 by 4X4NJ is pretty easy to understand as Europe has a nice QSO point premium that ON4UN and others in Europe do not enjoy.

The CW scores were reasonably healthy in 1992 with the 25th place finisher (HA4EHQ) breaking the 10K barrier with 13K points. This is typically a European dominated event, but notice the UA9AT (5th in world), UF6QBA (6th in world) and T32AF (11th in world) 160 meter CW scores as well. Participation and propagation are apparently looking up.

A major upset occurred in the US as K2EK edged perennial champion K5UR on 160 meter CW. Rick has dominated this event for so many years from Arkansas that we assume a win each year for him - but it simply wasn't to be in 1992.

Notice the fine showings by KV0Q (22nd in world) and N6SS (24th in world). Both of these stations are west of the Mississippi river and broke the 10K barrier. If you break 10K in either mode on 160 meter single band from the US, you are world class!

The 160 meter SSB portion was won by 9A1HCD in an impressive fashion as he overcame the QSO differential and held off IV3PRK and 4X4NJ.

KH6CC turned in his usual (15th in world) entry from the Pacific and UA9AT (7th in world) gave many people a new zone and band country in 160 meter SSB.

Worldwide participation in the 160 meter phone section was poor, with only sixteen stations breaking the 10K level.

AA4MM made the top 25 on 160 meter SSB with a score of less than 2K. US stations are asked to work a few VE's and send CQ Magazine your log. Perhaps there will be more participation in 1993.

Winning the world on 160 meters is probably one of the easiest strategies in the hobby. Get permission to operate 4U1UN during the contest on top band and borrow a "Battle Creek Special" for attachment to the United Nations building rooftop.

Every contact made with the US, has QSO point value and your path to VE isn't bad either. Add a few European and Caribbean multipliers (not trivial but feasible) to the equation and you are looking at a 100K plus effort on 160 meters.

SPOT OF THE MONTH CLUB WINNERS FOR OCTOBER 1993

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KD7SO
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Low Band Monitor
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Elizabeth, CO 80107
(303) 646-4630

• Conclusion - The year 1992 will be recorded as a great year for the CQWWDX Contest in both modes. Low band participants in 1993 will be seeing the beginning of the transition from the 10 and 15 meter bands to 40, 80 and 160 meter bands by the all band single operator and multi operator categories.

The low band operator will be seeing major efforts this year in the CQWWDX Contest from LU, KH0, OH0 and the usual assortment of surprises, that should provide us all with some excellent opportunities.

Top 25 - 160 Meter Operators
1992 CQWW CONTEST
A Low Band Monitor Exclusive

160 METER PHONE			160 METER CW		
1	9A1HCD	56	1	4X4NJ	150
2	IV3PRK	43	2	ON4UN	118
3	4X4NJ	39	3	9A1HCD	82
4	SM5AQD	34	4	ON7TK	81
5	OH4NRC	33	5	UA9AT	60
6	OZ3SK	32	6	UF6QBA	57
7	UA9AT	32	7	CT1AOZ	56
8	G3KMA	30	8	PJ9V	53
9	S57AV	29	9	OY9JD	52
10	WB9Z	21	10	G4PIQ	50
11	YV2IF	18	11	T32AF	49
12	OK1JDX	18	12	SP5ZIM	37
13	PA3FNE	18	13	K2EK	34
14	PJ9V	12	14	OG3MMF	30
15	KH6CC	12	15	F6CWA	28
16	EA3CCN	12	16	K5UR	25
17	F6AML	8	17	OH1KF	22
18	VE3DO	6	18	OH1MA	18
19	S51HB	5	19	PA0VDV	18
20	SP9GDB	3	20	SM6OLL	18
21	OZ1LO	3	21	DJ9LJ	17
22	W2FCR	3	22	KV0Q	16
23	UB5ZME	2	23	LY2BR	14
24	RB5ELM	1	24	N6SS	13
25	AA4MM	1	25	HA4EHQ	13

This year should offer more opportunity for the low band participant than in any of the the past four years.

If the propagation gods will cooperate, a significant increase in scores is possible.

If you haven't made a low band entry before, we suggest that you give it a try. A low band effort can be compressed to a few hours on either side of your sunrise and sunset and a decent score can be made.

The purists will of course stay up all night; hoping that their competition doesn't work too many daytime nets while they are sleeping. You make that decision!

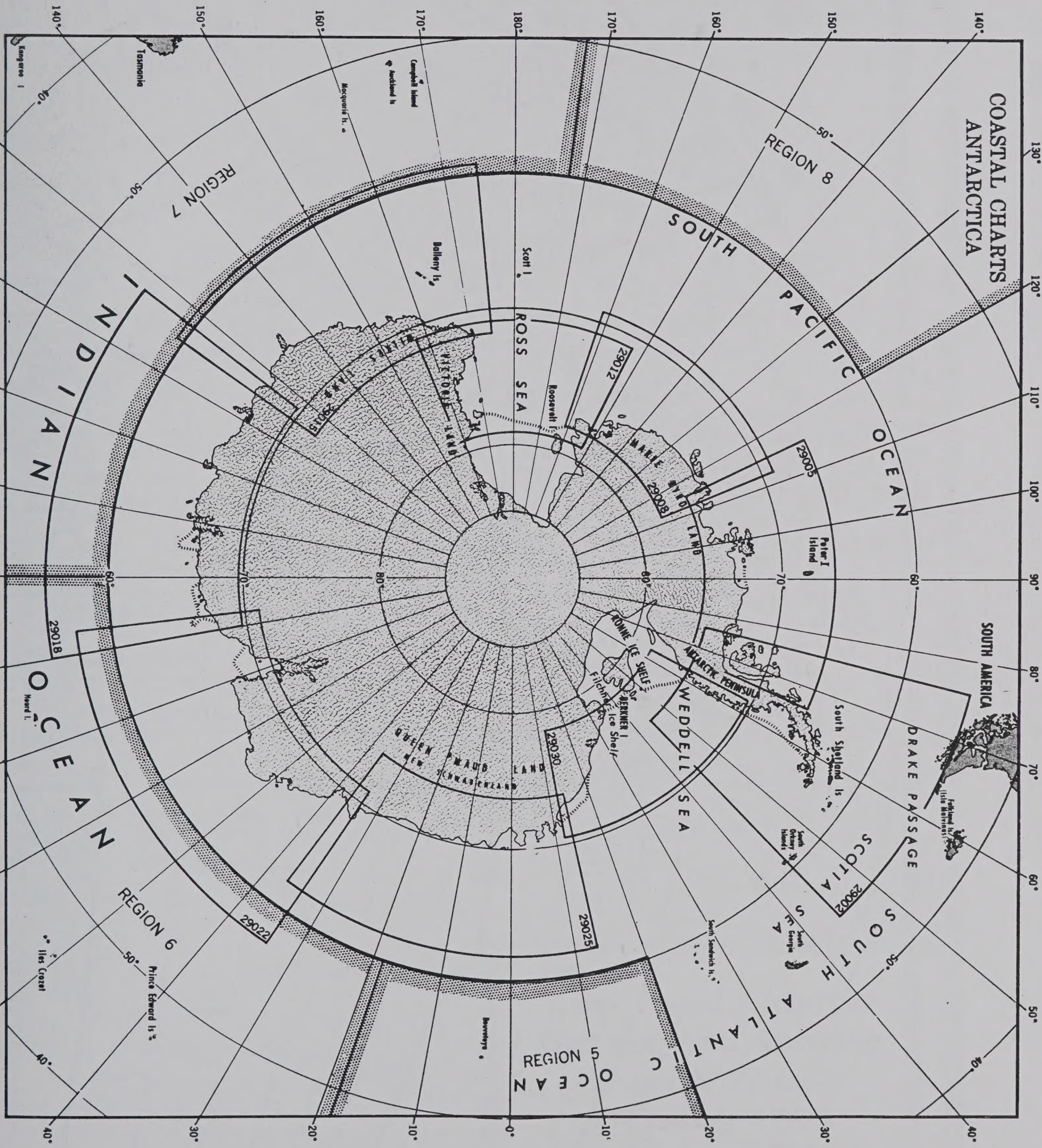
We hope to see your call in the top 25 this year!

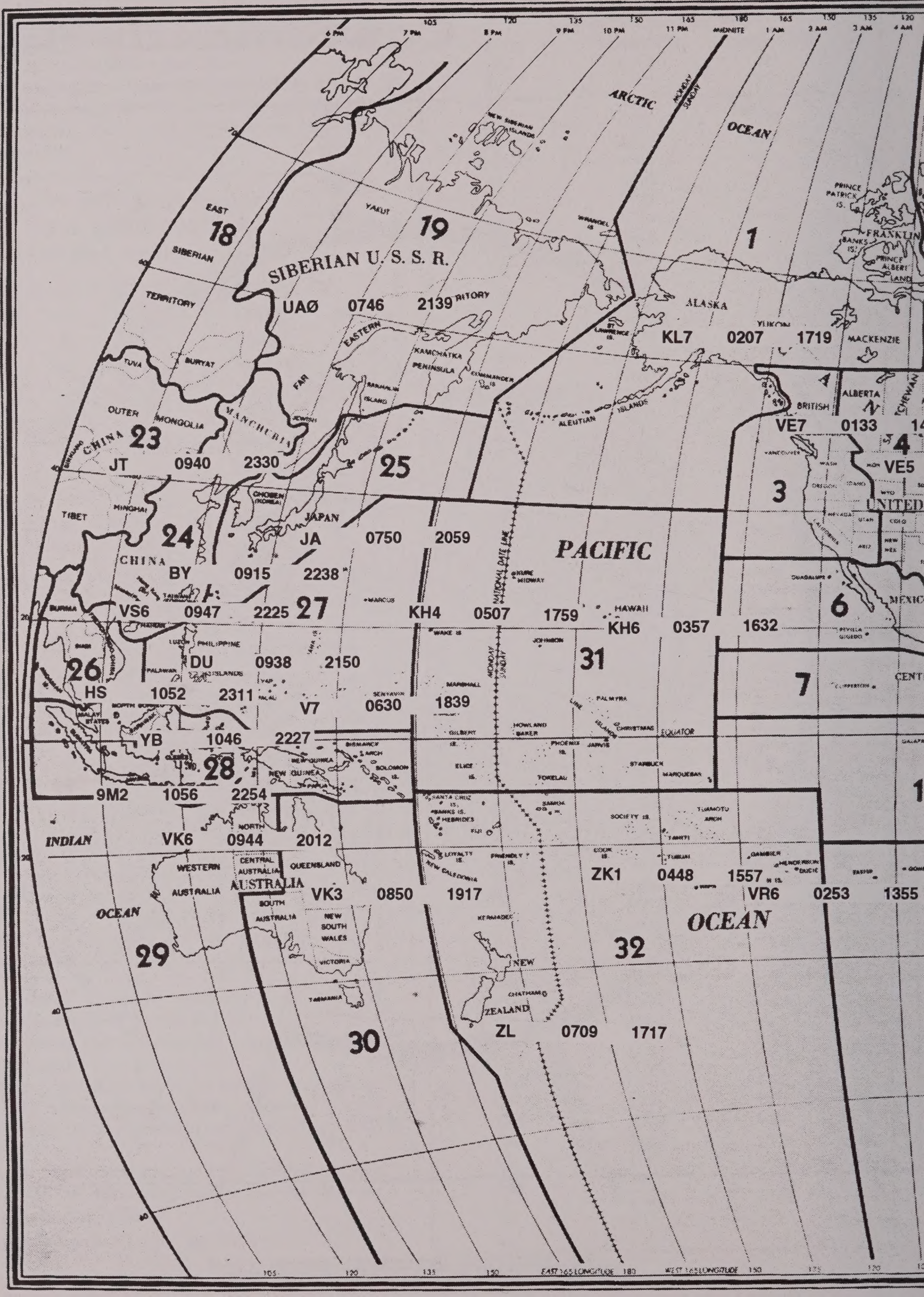
Low Band Monitor
Sunset and Sunrise Times
CQWW Phone 1993

Country	Sunset UTC	Sunrise UTC
VE7	0133	1448
KL7	0207	1719
VR6	0253	1355
KH6	0357	1632
ZK1	0448	1557
KH4	0507	1759
V7	0630	1839
ZL	0709	1717
UA0	0746	2139
JA	0750	2059
VK3	0850	1917
BY	0915	2238
DU	0938	2150
JT	0940	2330
VK6	0944	2012
VS6	0947	2225
YB	1046	2227
HS	1052	2311
9M2	1056	2254
UL7	1150	0123
VU	1238	0108
UH	1314	0229
OH	1434	0534
UB	1440	0442
5R	1457	0214
TA	1459	0421
SM	1505	0557
SU	1510	0405
SP	1514	0525
5Z	1518	0308
ST	1522	0345
LZ	1525	0455
OK	1546	0546
OY	1632	0748
F	1637	0632
G	1640	0648
7X	1654	0607
ZS	1711	0349
EA	1717	0640
TF	1723	0900
5N	1729	0534
EA8	1819	0709
ZD8	1853	0630
D4	1907	0732
ZD9	1919	0546
OX	1921	1059
PY	2104	0810
VP9	2131	1032
KP4	2154	1022
YV	2204	1018
CX	2211	0846
LU	2220	0855
VE3	2213	1148
C6	2231	1114
VP8	2252	0818
OA	2306	1036
CE	2307	0946
VE5	2330	1308
HC8	2350	1142
JW	------	------
4K1	------	------

Where Is Peter I?

Conveniently South!





6 PM
7 PM
8 PM
9 PM
10 PM
11 PM
MIDNITE
1 AM
2 AM
3 AM
4 AM
105
120
135
150
165
180
165
150
135
120
ARCTIC
OCEAN
MONDAY
SUNDAY
NEW SIBERIAN ISLANDS
WRANGEL IS.
EAST
SIBERIAN
TERRITORY
18
YAKUT
19
SIBERIAN U. S. S. R.
UAØ 0746 2139
TERRITORY
EASTERN
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PENINSULA
COMMANDER IS.
1
ALASKA
KL7 0207 1719
YUKON
MACKENZIE
PRINCE PATRICK IS.
BANKS IS.
PRINCE ALBERT LAND
FRANKLIN
ST. LAWRENCE IS.
ALEUTIAN
ISLANDS
TUVA
BURYAT
OUTER
MONGOLIA
MANCHURIA
CHINA
23
JT 0940 2330
25
SAKHALIN ISLAND
CHOSEN (KOREA)
JAPAN
TIBET
24
CHINA
BY 0915 2238
JA 0750 2059
BURMA
VS6 0947 2225
27
MARCUS
KH4 0507 1759
MIDWAY
NATIONAL DATE LINE
PACIFIC
HAWAII
KH6 0357 1632
JOHNSON
WAKE IS.
LUZON
PHILIPPINE
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DU 0938 2150
PALAWAN
HS 1052 2311
MALAY STATES
NORTH BORNEO
V7 0630 1839
MARSHALL
MONDAY
SUNDAY
31
PALMYRA
CHRISTMAS
EQUATOR
HOWLAND
BAKER
PHOENIX IS.
JARVIS
YB 1046 2227
BISMARCK ARCH
NEW GUINEA
SOLOMON IS.
28
GILBERT IS.
ELLICE IS.
TOKELAU
STARBUCK
MARQUESAS
9M2 1056 2254
SANTA CRUZ IS.
BANKS IS.
NEW HEBRIDES
FIJI
SAMOA
SOCIETY IS.
TUAMOTO ARCH
INDIAN
VK6 0944 2012
NORTH
WESTERN
AUSTRALIA
CENTRAL AUSTRALIA
QUEENSLAND
AUSTRALIA
SOUTH AUSTRALIA
NEW SOUTH WALES
VICTORIA
TASMANIA
VK3 0850 1917
LOYALTY IS.
NEW CALEDONIA
FRIENDLY IS.
COOK IS.
TUBUAI
GAMBIER
ZK1 0448 1557
VR6 0253 1355
OCEAN
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KERMADEC
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OCEAN
NEW
ZEALAND
CHATHAM
ZL 0709 1717
30
BRITISH
ALBERTA
VE7 0133
4
VE5
3
WASH
OREGON
IDAHO
UNITED
CALIFORNIA
NEVADA
UTAH
COLO
ARIZ
NEW MEX
6
MEXICO
GUADALUPE
REVILLA GIGEDO
7
CLIPPERTON
GALAPAGOS
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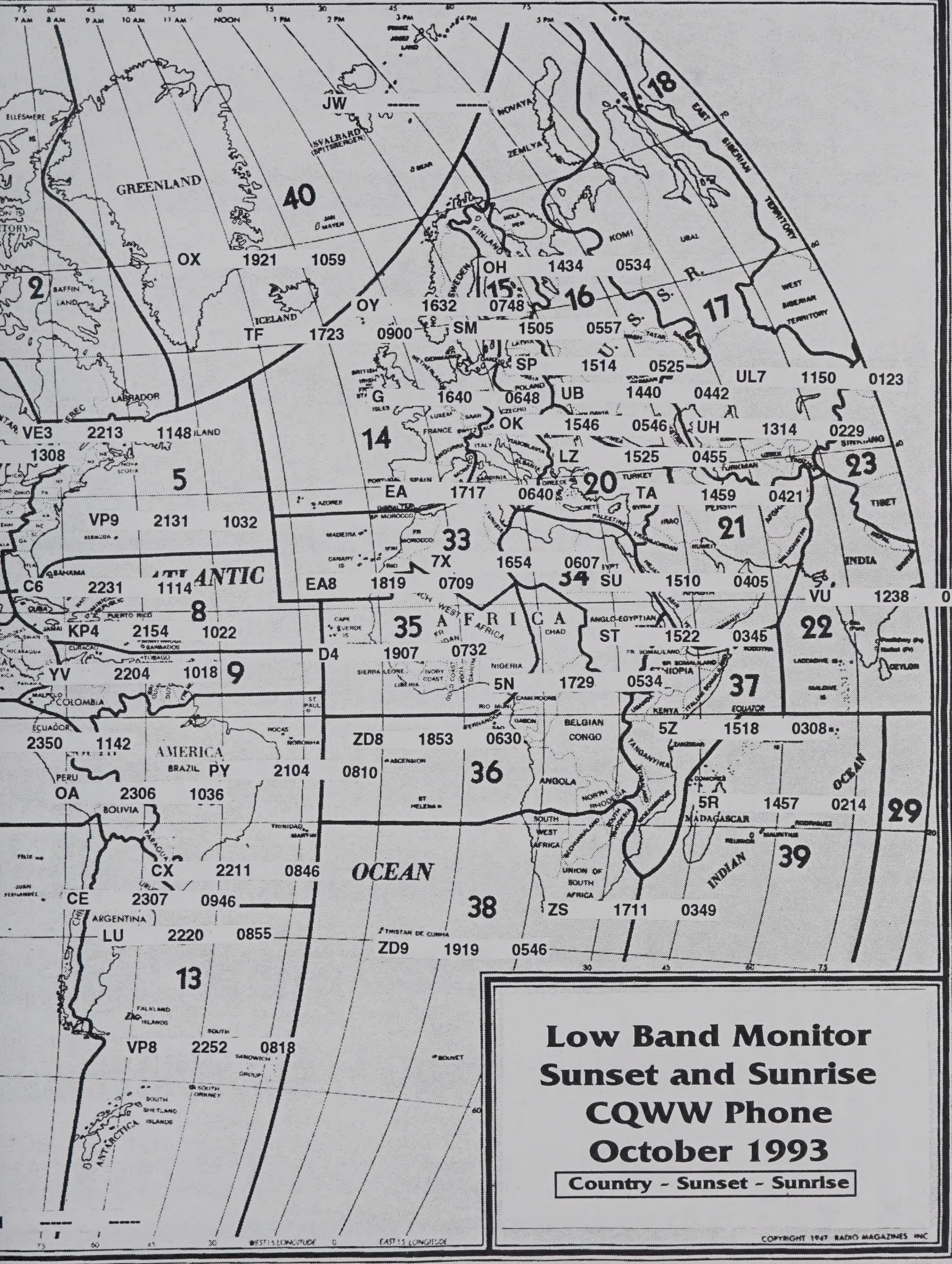
20
EAST 165 LONGITUDE 180
WEST 165 LONGITUDE 150



Country	Sunset	Sunrise
JW	-----	-----
OX	1921	1059
OH	1434	0534
OY	1632	0748
TF	1723	0900
SM	1505	0557
SP	1514	0525
UL7	1150	0123
G	1640	0648
UB	1440	0442
OK	1546	0546
UH	1314	0229
VE3	2213	1148
		1308
LZ	1525	0455
EA	1717	0640
TA	1459	0421
VP9	2131	1032
7X	1654	0607
C6	2231	1114
EA8	1819	0709
SU	1510	0405
VU	1238	0108
KP4	2154	1022
ST	1522	0345
D4	1907	0732
YV	2204	1018
5N	1729	0534
5Z	1518	0308
ZD8	1853	0630
	2350	1142
PY	2104	0810
OA	2306	1036
5R	1457	0214
CX	2211	0846
CE	2307	0946
ZS	1711	0349
LU	2220	0855
ZD9	1919	0546
VP8	2252	0818
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Low Band Monitor Sunset and Sunrise CQWW Phone October 1993

Country - Sunset - Sunrise

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1992 CQWWDX Contest Low Band Milestones

with John Dorr - K1AR and K1ZM

The following printout indicates each of the first countries worked by John Dorr, K1AR's fine Multi-Multi Station during the 1992 CQWW CW Contest. K1AR won the Multi-Multi class for the US and was one of the first stations to ever work 5-Band DXCC in a single weekend. Below you will find a chart that shows the distribution of QSO's for this station. You can see the direction propagation is going - 38 percent of the QSO's were made on the 40, 80 and 160 meter bands. Note that 40 meters yielded 141 more QSO's than 20 meters.

K1AR Multi Multi 29 Nov 1992 2359z

PRFX	160	80	40	20	15	10
3A				3A2LF	3A2LW	
3X					3X0HNU	
4K2			4K2MAL	4K2MAL	4K2MAL	
4S				4S7WP		
4U1/i	4U1ITU	4U1ITU	4U1ITU	4U1ITU	4U1ITU	4U1ITU
4U1/v		4U1VIC	4U1VIC	4U1VIC	4U1VIC	4U1VIC
4X	4X4NJ		4X4VF	4X/S59PR	4Z4DX	4X4RE
5B			H21A	H21A	H21A	H27W
5N						5N0ZKJ
5T		5T5CJ				
5U			5U7M	5U7M	5U7M	5U7M
5X					5X5WR	
5Z			5Z4PI	5Z4TT	5Z4TT	
6W	6V6U	6V6U	6V6U	6V6U	6W7/F6BFH	6V4BC
6Y		6Y5RJ		6Y5IC	6Y5IC	
7P			7P8FE	7P8SR	7P8SR	7P8SR
7Q			7Q7XX	7Q7TA	7Q7XX	7Q7XX
8P	8P9Z	8P9Z	8P9Z	8P9Z	8P9Z	8P9Z
8R	8R1K	8R1K	8R1K	8R1K	8R1K	8R1K
9A	9A2TW	9A2HQ	9A3IQ	9A1A	9A3SM	9A1CCY
9H		9H3QT	9H3QT	9H3QT	9H3QT	9H1EL
9K				9K2USA		
9M2				9M2FK		
9M6			9M6NA	9M6NA	9M6NA	
9V				9V1YC		
9Y	9Y4H	9Y4H	9Y4H	9Y4H	9Y4VU	9Y4H
A2			A22MN	A22SK	A22SK	A22MN
A4						A45XF
A6			A61AC	A61AC	A61AC	
BV		BV/K1RX	BV/K1RX	BV/K1RX	BV/K1RX	BV/K1RX
BY			BY4AA	BY4SZ	BY4SZ	
C6	C6A/N4RP	C6AHJ	C6AHU	C6AHJ	C6A/N4RP	C6A/N4BP
C9				C9RJJ	C9RJJ	C9RJJ
CE			XR1X	CE2LZN	XR1X	XR3A
CM	CO2KK	CO2JA	T42CW	CO2JA	CO3AL	T42CW
CT	CT1AOZ	CR5A	CT1ZC	CT1YH		CT1AIU
CT3		CT3FN			CR3W	CT3FT
CU				CU2AK		
CX			CX9AU	CX7BY	CX0CW	CX5BW
D4	D44BC	D44BC	D44BC	D44BC	D44BC	D44BC
D6						D68GA
DL	DJ6QT	DL7UKA	Y48I	DL0CS	DJ8CR	DL0TUD
DU				DU3HF	DU3HF	
EA	EA3KU	EA5BA	EA7CA	EA3KU	EA3KU	EA2IA
EA6	EA6ZY	EA6ZY	EA6ZY	EA6BD	EA6ZY	EA6ZY
EA8	EA8EA	EA8EA	EA8EA	EA8EA	EA8EA	EA8URL
EA9	EA9EA	EA9EA	EA9EA	EA9EA	EA9EA	EA9EA
EI	EI7M	EI7M	EI7M	EI6FR	EI9FK	EI5DI
EL						D54JZ
ES		ES4RO	ES1J	ES5MC	ES6PZ	ES7GN

K1AR Multi Multi 29 Nov 1992 2359z

PRFX	160	80	40	20	15	10
LZ		LZ2KSQ	LZ5N	LZ5N	LZ1BJ	LZ1MC
OA	OA4ZV	OA4ZV	OA4ZV	OA4ZV	OA4CWR	OA4CWR
OD			OD5/SP1MHV	OD5/SP1MHV	OD5/SP1MHV	OD5/HB9AMO
OE		OE3GSA	OE5BWN	OE2VEL	OE6RAG	OE2VEL
OH		OH2BSQ	OH2BS	OG6NIO	OH5NM	OH1MA
OH0		OH0W	OH0W	OH0W	OH0W	OH0W
OK	OK1CZ	OK2FD	OK3RM	OK3KFF	OK1DJO	OK5W
ON	ON4UN	ON5TK	ON6AH	ON6AH	ON6AB	ON4WW
OX			OX3XR	OX3RA		
OY	OY9JD	OY1CT	OY1CT	OY1CT	OY3QN	OY1CT
OZ	OZ1LO	OZ5MJ	OZ1KWC	OZ1JLX	OZ7YL	OZ1FFG
P2					P29DK	P29PL
P4	P40W	P40I	P40I	P40J	P40W	P40I
PA	PA0CLN	PI4COM	PA0AAC	PI4COM	PA0DIN	PI4TUE
PJ9	PJ9V		PJ9U		PJ9W	PJ9M
PY		PW2N	PY2BW	ZV5A	PY5BLG	ZX4VG
PY0/f		PT0F	PT0F	PT0F	PT0F	PT0F
PZ		PZ1DV		PZ1DV		PZ1AP
S7		S79S	S79S	S79S	S79S	S79S
SM		SM6MCW	SM6EAN	SM0TW	SM0KV/0	SM3SGP
SP		SP8NR	SP9WZJ	SP9WZJ	SP6CYX	SP5MBA
ST				ST2HZ	ST2HZ	ST2HZ
SU				SU1AH		SU1AH
SV		SV1SV	SV1SV	SV1YR	SV1SV	SV1SV
SV5		SV5/W4PRO	SV5/SM0CMH	SV5/W4PRO	SV5/SM0CMH	SV5/SM0CMH
T7		T77C			T70A	T70A
T32	T32AF	T32BE	T32BE	T32BE	T32BE	T32BE
TA			TA2D	TA3D		TA3D
TF		TF3CW	TF3CW	TF3CW	TF3CW	TF3CW
TG				TG9AJR	TG9AJR	TG9AJR
TI	TI2PZ	TI1C	TE1T	TE1T	TE1T	TI1C
TK			TK5EL	TK5EL	TK5EL	
TU			TU2MA	TU4SR	TU2CI	TU2MA
UA		EZ6L	UX1A	UX1A	UA6HRZ	UX1A
UA9		RW9C	UA9OA	RZ9UA	UZ0CXD	UV9FM
UA2	UW2F	UW2F	UW2F	UW2F	UA2WJ	UW2F
UB		UB4AXN	UT4UET	RY1I	RB5LJ	RB5FQ
UC		UC8A	UC8A	UC2SN	UC2WAZ	UC2OL
UD			UD6DFF	RD8DYL	UD6DF	
UF		UF7FXC		UF6FJ	UF6FFF	UF6FFF
UG				UG6GG		
UH				RH8AX	UH8BO	
UI			UI8BAA			
UJ			UJ8JA		UJ8JMM	
UL			UL7JGX	RL5P	RL7EC	
UM				RM8MW	RM8MW	
UN1					UA1NDY	
UO		RO0F	UO5ON	RO0Q	UO5ON	RO0F
V3			V31DX	V31DX	V31RY	V31DX
V4	V47KP	V47KP	V47KP	V47KP	V47KP	V47KP

F	F6CWA	F2CW	F6GDK	F6CEL	F3VV	F6FGZ
FG	FG5BG	FG4FR	FG4FR	FG4FR		
FK			FK8FU			
FM	FM5WD		FM5BH		FM2GO	FM4RZ
FO		FO/SM5NZY	FO/SM5NZY	FO/SM5NZY		
FP	VE7HJU/FP	FP/VE1DX	VE7HJU/FP	FP/VE1KM	FP/VE1KM	
FS		FS/AI7B	FS/AI7B	FS/AI7B	FS/AI7B	FS/AI7B
FY			FY5FY	FY5YE	FY5FY	FY5FY
G	G3VHB	G3UFY	G3SWH	G4BUO	G3SWH	G3SSO
GD	GD0PWW	GD4UOL	GD4UOL	GD4AM	GD4UOL	GD4AM
GI		GI0KOW	GI0KOW	GI0KOW	GI0KOW	GI4SNC
GJ	GJ/K2WR	GJ/K2WR	GJ/K2WR	GJ2LU	GJ2LU	GJ/K2WR
GM	GM3YOR	GM4SID	GM3POI	GM3PFQ	GM0IIO	GM3XNJ
GM/s				GM0DJI		
GU		GU3HFN	GU3HFN	GU3HFN	GU3HFN	GU3HFN
GW	GW3YDX	GW3HGJ	GW3SYL	GW8GT	GW3HGJ	GW3SYL
H4			H44IO	H44IO	H44IO	H44IO
HA	HG73DX	HG73DX	HA8KCK	HA0HW	HA8VK	HA3KNA
HB		HB9BPP	HB9APJ	HB9AGA	HB9AGA	HB9BWB
HC			HC5AI	HC5AI	HC5AI	HC5AI
HC8	HC8N	HC8N	HC8N	HC8N	HC8N	HC8N
HH	4V2PK	4V2PK	4V2PK	4V2PK	4V2PK	4V2PK
HK					HK3RQ	HK3RQ
HL				HL5AP	HL5AP	
HM					P5DTG	P5DTG
HP	HP1AC	HP1XBH	HP1AC	HP1AC	HP1XQN	
HS			HS0AC	HS0AC		
HZ		7Z2AB	HZ1AB	HZ1AB	HZ1HZ	HZ1HZ
I	I4IKW	I7ALE	IK0ADY	I0IA	I8QFK	I0HCJ
IS		IS0OMH	IS0MKU	IS0OMH		
IT			IT9TQH	IT9UCS	IT9UCS	IT9JPK
J2			J20UFT	J28FO	J20UFT	J20UFT
J3	J33A	J33A	J33A	J33A	J33A	
J7	J79MAE	J79MAE	J79MAE	J79MAE	J79MAE	J79MAE
JA		JA1YDF	JA1LZR	JR7QKH	JA1CKE	JA1YDU
JT				JT1CS	JT1CS	
JW			JW5NM	JW9XG	JW9XG	JW9XG
JX			JX7DFA	JX7DFA		JX7DFA
JY		JY8VJ	JY8VJ	JY8VJ	JY8VJ	JY8VJ
KC4				KC4AAA	VP8GAV	VP8GAV
KH2			KH2S	KG6DX	KE2PF/NH2	KH2S
KH6	KH6CC	NH6T	NH6T	NH6T	KH6XT	NH6T
KH0		KH0AM	KH0AM	KH0AM	KH0AM	KH0AM
KL7		NL7G	NL7G	NL7G	NL7G	AL7CQ
KP2	KP2A	NP2I	NP2I	NP2I	NP2I	NP2Q
KP4	NP4Z	KP4TK	NP4Z	KP4/WJ2O	K3TEJ/KP4	WP4IIW
LA		LA6MP	LA6CF	LA1OF	LA1K	LA8D
LU		LU7DP	LU7DP	LU3UI	LU4FM	LU7EAR
LX		LX/DF0BK	LX0RL	LX1FJ	LX/DF0BK	LX2PA
LY		LY3BU	LY2BM	LY3BU	LY4W	LY1DW

V7			V73C			
V8				V85PB		
VE	VE3CUI	VY2SS	VD3CDX	VE3CKF	VE3EJ	VE3HX
VK		VK7TS	VK3APN	VK3ZC	VK6BB	VK8AV
VP2E	VP2EC	VP2EC	VP2EST	VP2EC	VP2EST	VP2EC
VP2V		VP2VE	VP2VE	VP2V/KG6WI	VP2VE	VP2V/KG6WI
VP5	VP5T	VP5T	VP5T	VP5T	VP5T	VP5T
VP8	HF0POL	HF0POL	HF0POL	HF0POL	HF0POL	HF0POL
VP9	VP9GD	VP9GD			VP9GD	
VQ9		VQ9IO	VQ9IO	VQ9IO	VQ9IO	
VS6		VS6WO	VS6WO	VS6WO	VS6WO	VS6WO
VU			VU2MTT	VU2SR		
W	KY1H	W3HNK	WF3J	N1JAC	KA6NAL	KY1H
XE		XE1VV	XE1/AA6RX	6D2X	XE1/AA6RX	6D2X
YB				YE2C	YE2C	YE2C
YL		YL2GP	YL2KL	YL2GN	YL2HB	YL2HO
YN			HT1T		HT1T	HT1T
YO	YO2BP	YO2BP	YO8BNG	YO4NF	YO6LV	YO7CFD
YU	YU7AU	4N9A	YT7ZV	YU7AV	YU1EXY	4N7M
S5	S57MM	S53EA	S58MM	S51AW	S57AM	S52AA
4N4		4N4T	4N4ENS	YU4XA	4O4AA	4N4PH
4N5		4N5W	YZ5AA	4N5M	4N5DR	4N5AA
YV	4M2BYT	4M2BYT	YX5A	4M2BYT	4M2BYT	4M2BYT
Z2					Z21HQ	Z21HS
ZA		ZA1A	ZA1A		ZA1A	ZA1A
ZC		ZC4BG	ZC4Z	ZC4Z	ZC4BG	ZC4Z
ZD8					ZD8LII	
ZF			ZF2TG		ZF2KK	
ZK1/s				ZK1TB		ZK1TB
ZL	ZM2K	ZL1AMO	ZM2K	ZM2K	ZM2K	ZM2K
ZP			ZP5JCY	ZP5JCY	ZP5JCY	ZP5JCY
ZS			ZS6EZ	ZS6EZ	ZS1AFZ	ZS6EZ

BAND	QSO	ZONE	COUNT
160	106	16	59
80	726	29	107
40	1862	37	141
20	1721	39	156
15	1584	37	154
10	1128	34	136
TOTAL	7127	192	753

K1AR SCORE = 19,473,615

Jeff Briggs, K1ZM also sent a copy of his multiplier sheet for the 1992 CQWWCW Contest. Jeff currently holds the alltime US single band CW record for the 10, 40 and 80 meter bands. He managed to make 1,059 contacts on the 80 meter band and matched the 80 meter effort at K1AR (K1MM operator) multiplier (30 vs.29 zones and 106 vs.107 countries) to multiplier. The following information will make good Dayton Hamvention™ hospitality room trivia. K1AR and K1ZM both missed zone 12 on 80 meters. K1ZM worked 4X, 5U, A2, A6, FM, HK, 4K2 and ZS that K1AR missed. K1AR worked 5T, FG, FO, IS, J7, LU, PY, PYØ, and SV, that K1ZM missed. Jeff uses a 4 square vertical array on 80 meters with 150 radials under each vertical, complemented by elevated radials.

The S.E.A.N.C.E. Net of 1993

160 Meter Propagation In the Pacific - with VK4YB and VE7BS

Editors Note: This article is only a primer. We can simply not do justice to the amount of time and data that has been generated by the S.E.A.N.C.E. activity in the past three years. The purpose of this article is two fold 1.) Introduce our readers to VK4YB and VE7BS and 2.) Review some of their methods for charting 160 meter propagation.

The name S.E.A.N.C.E. stands for the South East Australia to North America Communications Exchange Net that meets every morning from May 14, 1993 to August 13, 1993 at 1100Z on 1832 khz.

This is an informal SSB net that is handled by Roger Crofts, VK4YB and it has been active since 1991.

The S.E.A.N.C.E. net attempts to answer the question, "Is there anyone there on the other side?"

On some mornings this net will have as many as a dozen check-in's from the Pacific. The participant from North America can get a very good feel for 160 meter propagation by monitoring this net for a few days, and with a little luck, possibly add a new 160 meter band country

Roger Crofts has been an active low band DXer since 1965 and has held the calls, G3UPK, ZB2AY, GM3UPK, GW3UPK, ZD8AY, ST2AY, TJ1AY, VK6YA and PY1ZFX. He has experimented with just about every type of antenna ever conceived for 160 meter work and describes himself as a "true" DXer, meaning he is involved in the hobby to pursue DX contacts, not the acquisition of QSL cards. He does QSL all cards received, he just doesn't focus on them. *(A humorous profile of Roger follows.)*

Because of Roger's discipline in conducting this net on consecutive days, for three straight years, he has provided a framework for monitoring 160 meter propagation that has captured a number of enthusiasts imagination.

That's where Bob Eldridge, VE7BS enters the picture. VE7BS is one of Canada's most accomplished 160 meter Dxer's who has achieved 160 meter DXCC from a most difficult part of the world.

Bob has religiously monitored this net for three years and has gained some insight into the tendencies of this path that can be applied to general DXing.

A true student of propagation, Bob provided the *Low Band Monitor* with some insight on the "17.5 Percent Solution", 160 meter Delta Loop that was discussed in our last issue. We will review Bob's data in a future issue.

Charting 160 Meter Propagation - Let's look at some of the basic techniques that VK4YB and VE7BS use to monitor the 160 meter band.

Roger maintains a simple record of the maximum signal strength heard from North America during each day the net was in session.

The results are then plotted over the 92 day period and yield some interesting results:

- The weakest North American heard was a 52. The loudest signal heard from North America was 59 plus 15 db.
- Only 12 of the days out of 92 yielded maximum signals less than a very manageable 55 report. Communication was made on each day the net operated.
- Reports above 59 plus 5 db occurred only once on three consecutive days. (July 29, 30, 31)
- Reports above 59 occurred six times on two consecutive days.(May 2, 3, July 20, 21, July 23, 24, July 29, 30, July 30, 31, Aug 10, 11)
- Signal strengths tend to trend upward from the beginning of the session in April until the end of the session in August.

Bob's method of monitoring the S.E.A.N..C.E. net is shown on the enclosed chart. Lets review his methods. Please refer to the graph on the next page.

1. Notice how VE7BS takes the basic Month of the Year vs. Time in UTC graph and creates a plot of his sunrise for the entire net period. This is the vee shaped "VE7BS Sunrise" line.
2. Bob then records the time of day that a VK station is first heard and then the time of day that the last VK station is heard. These are the vertical lines that appear at different lengths along the "VE7BS Sunrise" line.
3. Notice the length of these lines. Some mornings the net is audible way before Bob's sunrise for well over an hour. On some mornings the opening is very short.
4. Notice how on some mornings the net is audible well past sunrise. This occurred often in May and a few times in June.
5. WWV numbers can be correlated to these observations as Bob has done at the top of the chart with the solar flux and Boulder A index.

Conclusion - Bob Eldridge, VE7BS has accumulated three years of data based on the VK4YB S.E.A.N.C.E. Net observations. He can now observe this net data and start to look at trends observed on this Pacific path over time.

Are the VK signals being heard for longer periods now? Are the VK signal levels getting better in April than in previous years? Are more VK signals being heard past your sunrise now than in 1991?

The answer to these questions hopefully are yes, because one would think that the quality of this 160 meter path would be a barometer for all worldwide 160 meter paths.

The *Low Band Monitor* will develop some charts similar to Bob's and provide them to our readers who could easily apply this scheme to other popular paths. The only requirement of the reader would be the knowledge of one's sunrise.

I am particularly intrigued with the actual occurrence of an opening relative to the exact sunrise time. Bob's technique will help us all understand this phenomena more clearly.

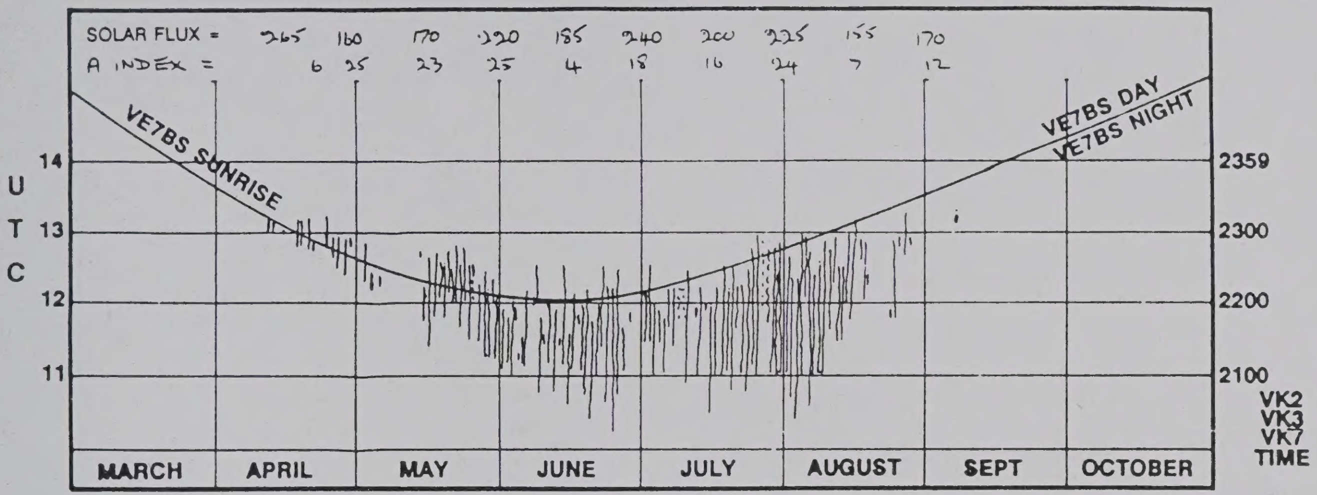
Some observations of the North American East Coast to Europe 160 meter path would be interesting. Remember, the methodology used by VK4YB and VE7BS could easily be applied to 75 and 80 meters, particularly long path.

Some of our readers have speculated that the S.E.A.N.C.E. net is actually a conspiracy for a large coffee consortium. I have to admit that a "S.E.A.N.C.E. morning" is typically a "two pot" morning, but the effort is worth it on some mornings.

We will periodically share the insights of these two 160 meter Dxer's with our readers and will develop the graph format in the next few weeks.

Plotting 160 Meter Propagation

The graph below represents the S.E.A.N.C.E. net 160 meter propagation for VK stations that are heard at station VE7BS between mid April and mid August. Notice how the duration of the opening (vertical lines) for each day varies significantly relative to the sunrise of VE7BS (Pemberton, British Columbia). Solar Flux and Boulder "A" Index data parameters are listed at the top of the graph. This graph is for 1991. VE7BS has been tracking this Australian net for three consecutive years.



1991 160 METER OPENINGS FROM VE7 TO VK

Who is Roger Crofts - VK4YB?

S.E.A.N.C.E. Net Iron Man - by VK4HF

After 25 years of ham radio, wouldn't it be nice to look back on how he got started and what he's achieved The early days of Roger's hamming are not all that clear, so I questioned some of his neighbors in Pommie Land - England. It seems that at an early age, Roger had tendencies toward radio. When at the age of four, he built a 10 wave length Rhombic for the broadcast band and hooked it up to his parents mantle radio.

Police believe arson was the cause of a fire which broke out in the lounge room, but we know differently, don't we? After a misspent youth doctoring public telephone boxes to get free long distance calls anywhere in the UK, Roger came to the conclusion that we all have and that it's pretty boring talking to a bunch of Poms all the time. In his teens "The Dodge" did what so many other UK operators did and filled out the coupon on the cornflakes box and sent it off to the post office and three weeks later he was G3UPK and working DX.

Not long after, all of Britain was gearing up for yet another "top band" 160 meter contest, all tuning up their 10 watt transmitters with all of the usual stuff. Putting lots of oil on the pedals so you don't get tired half way through and there's Roger putting the final touches to his 28 TV sweeptubes in parallel, all donated to him by the surrounding neighborhood from TV's that had intermittent reception problems. This was too much for the Crofts family and they had to move yet again. This time, Roger's dad had to take work out of the country where nobody would know them.So off to Gibralter and a change of call signs - but this is just the beginning.

Radiation poisoning is diagnosed in the apes of the rock and once again Roger is banished. He pops back to England, steals a Land Rover in the dead of night (probably because he couldn't find a Nissan anywhere) and drives all the way to Africa and, yes, again he has to be moved on after a short stay in each country because the natives became restless and to this day are still fighting. After much fast talking and a lot of TVI behind him, Roger and Myrtle escape to Oz. Here he meets Mary, a quaint, cheerful girl doing five years for drunkeness. After the prison break, the pair set sail in Myrtle, on a tour of what used to be a world of happy people watching TV.

With a state-of-the-art Atlas in the 4wd, they led a Bonny and Clyde lifestyle, always questioned by police, not paying for accomodations and having regular schedules with assorted Pommie baskets.

Q.R.M - The Official Journal of the Redcliffe Radio Club (Australia)

LOW BAND MONITOR POWER SPOTS - OCTOBER, 1993

TNX: N8HTT - W8TN - KYØA - N2KK - KD7SO - N6SS

160 METERS

1840.0	HH7PV	18-Oct-1993	0238Z
1831.0	EA8AZ	17-Oct-1993	2232Z
1825.0	V73C	17-Oct-1993	1215Z
1833.0	KH6AT	17-Oct-1993	1153Z
1832.0	FG5BG	17-Oct-1993	0350Z
1840.0	EA3JE	17-Oct-1993	0000Z
1832.9	KH6CC	16-Oct-1993	0451Z
1832.5	VP2VI	16-Oct-1993	0204Z
1832.6	4X4NJ	16-Oct-1993	0002Z
1835.3	6W6DX	15-Oct-1993	0354Z
1832.7	HB0/HB9NL	15-Oct-1993	0309Z
1832.2	FG5BG	15-Oct-1993	0152Z
1831.0	TI4CF	14-Oct-1993	0402Z
1832.7	FG5BG	14-Oct-1993	0303Z
1831.0	TI4CF	14-Oct-1993	0137Z
1829.0	ZD9SXW	12-Oct-1993	0225Z
1835.0	HH2PK	12-Oct-1993	0025Z
1833.7	HB0/HB9NL	11-Oct-1993	0357Z
1845.0	EA8PP	11-Oct-1993	0353Z
1834.9	CP2NE	11-Oct-1993	0146Z
1834.0	EA3JE	10-Oct-1993	2330Z
1828.4	YO3APJ	10-Oct-1993	0357Z
1840.0	RA6YY	10-Oct-1993	0315Z
1830.8	SM5EDX	10-Oct-1993	0245Z
1831.7	UB5ZAL	10-Oct-1993	0244Z
1834.4	PY0FF	10-Oct-1993	0230Z
1832.8	G3SZA	10-Oct-1993	0209Z
1834.8	PY0FF	10-Oct-1993	0120Z
1833.5	G3SZA	10-Oct-1993	0046Z
1832.0	GW3YDX	9-Oct-1993	2329Z
1836.4	VK3IO	8-Oct-1993	1113Z
1838.0	FK8CP	8-Oct-1993	1102Z
1829.8	G3PQA	8-Oct-1993	0250Z
1834.0	DJ8WL	8-Oct-1993	0219Z
1841.0	EA3JE	8-Oct-1993	0204Z
1833.0	G3ZFS	7-Oct-1993	2305Z
1836.9	EA3JE	7-Oct-1993	2303Z
1831.9	4X4NJ	7-Oct-1993	2301Z
1837.0	G0ORH	7-Oct-1993	2232Z
1834.6	G3XTT	7-Oct-1993	2231Z
1834.0	GB0SUB	7-Oct-1993	2229Z
1832.1	VK5BC	7-Oct-1993	1106Z
1839.5	LZ2WA	6-Oct-1993	2300Z
1839.7	G3RJM	6-Oct-1993	2258Z
1833.0	GM3ITN	6-Oct-1993	2257Z
1834.1	DF3OL	6-Oct-1993	2256Z
1828.9	EI5HJ	6-Oct-1993	2240Z
1831.7	4X4NJ	6-Oct-1993	2239Z
1836.4	G3RTY	5-Oct-1993	2149Z
1834.7	DJ8RL	5-Oct-1993	2130Z
1838.2	ON5HM	5-Oct-1993	2126Z
1832.0	VK5BC	5-Oct-1993	1036Z
1844.0	ZL1JR	5-Oct-1993	0726Z
1844.0	ZL2ADX	5-Oct-1993	0702Z
1844.0	ZL1HY	5-Oct-1993	0659Z
1832.7	VP2VI	3-Oct-1993	0458Z
1831.0	SM5EDX	3-Oct-1993	0438Z
1838.0	FK8CP	1-Oct-1993	1025Z
1850.0	CT1UP	1-Oct-1993	0605Z
1832.1	OK1DOT	1-Oct-1993	0428Z
1835.0	GD4BEG	1-Oct-1993	0351Z
1832.0	G3PQA	1-Oct-1993	0334Z
1823.9	**9V1ZB**	**1-Oct-1993**	**1300Z**
1843.0	OZ1DPR	30-Sep-1993	0149Z
1843.0	EA3JE	30-Sep-1993	0108Z
1830.3	G3SZA	29-Sep-1993	2319Z

160 METER NOTES

- A very real goal for the 160 meter band during the CQWWDX Test is to work all continents during the weekend or even within a 24 hour period.

- Let the *Low Band Monitor* know your WAC 160 meter contest results.

80 METERS

3794.5	4L4KK	18-Oct-1993	0209Z
3507.6	X5IW	18-Oct-1993	0156Z
3504.8	PZ1DY	18-Oct-1993	0133Z
3505.8	UC2WAF	18-Oct-1993	0125Z
3505.0	OM3CBU	18-Oct-1993	0019Z
3506.1	UJ8JA	17-Oct-1993	2238Z
3795.0	V73C	17-Oct-1993	1209Z
3794.0	FS/JG1RXQ	17-Oct-1993	1020Z
3506.8	V47RM	17-Oct-1993	1005Z
3800.0	GD4PTV	17-Oct-1993	0604Z
3501.2	ZS6NW	17-Oct-1993	0337Z
3792.5	Z31PK	17-Oct-1993	0332Z
3791.7	S52CD	16-Oct-1993	2335Z
3507.2	9A2AW	16-Oct-1993	2216Z
3799.6	TU5DX	16-Oct-1993	2135Z
3796.0	FO4OK	16-Oct-1993	1146Z
3503.0	FS/JL1MUT	16-Oct-1993	0556Z
3797.0	VP2EY	16-Oct-1993	0514Z
3505.0	9A2AW	16-Oct-1993	0447Z
3795.1	HH2JR	16-Oct-1993	0334Z
3512.0	XT2BW	15-Oct-1993	2224Z
3797.9	5T5JC	15-Oct-1993	2204Z
3799.0	V73C	15-Oct-1993	1152Z
3513.0	6W6JX	15-Oct-1993	0422Z
3794.5	9K2ZZ	15-Oct-1993	0103Z
3500.5	JW9DFA	14-Oct-1993	2218Z
3798.3	V73C	14-Oct-1993	1150Z
3507.0	4K1F	14-Oct-1993	0210Z
3508.0	ZD8VJ	13-Oct-1993	2346Z
3510.6	6W6JX	13-Oct-1993	2317Z
3795.1	TU5DX	13-Oct-1993	2256Z
3507.0	GB1OTA	13-Oct-1993	2244Z
3510.6	6W6JX	13-Oct-1993	2307Z
3799.0	FR5DX	13-Oct-1993	1410Z
3508.6	V85KX	13-Oct-1993	1409Z
3795.0	9M2DM	12-Oct-1993	1134Z
3795.0	V85PB	12-Oct-1993	1035Z
3506.3	Z31VP	12-Oct-1993	0217Z
3506.1	ZD9SXW	12-Oct-1993	0105Z
3506.1	TR8MC	12-Oct-1993	0104Z
3505.7	ZD9SXW	11-Oct-1993	2141Z
3502.0	V85KX	11-Oct-1993	1440Z
3504.0	HL9AX	11-Oct-1993	1345Z
3507.5	TU2MA	11-Oct-1993	0540Z
3800.0	4Z4UR	11-Oct-1993	0359Z
3510.0	3DA0BK	11-Oct-1993	0348Z
3803.0	HZ1AB	11-Oct-1993	0226Z
3509.8	3DA0BK	11-Oct-1993	0205Z
3802.8	HZ1AB	11-Oct-1993	0149Z
3505.4	ZD9SXW	10-Oct-1993	2340Z
3792.0	TU5DX	10-Oct-1993	2340Z
3799.7	J69J	10-Oct-1993	2306Z
3510.0	3DA0BK	10-Oct-1993	0322Z
3509.0	5Z4FO	10-Oct-1993	0317Z
3505.1	4Z4DX	10-Oct-1993	0254Z
3505.5	VQ9QM	10-Oct-1993	0127Z
3505.0	ZD9SXW	9-Oct-1993	2345Z
3799.7	GD4PTV	9-Oct-1993	2306Z
3796.4	VK9NS	9-Oct-1993	1055Z
3799.0	PY0ZFB	9-Oct-1993	0130Z
3505.0	ZD9SXW	8-Oct-1993	2233Z
3792.0	FK8FU	8-Oct-1993	1054Z
3506.2	OM3CQR	8-Oct-1993	0248Z
3792.0	HZ1AB	8-Oct-1993	0230Z
3795.0	S53TK	7-Oct-1993	2340Z
3505.0	SM6DQC/T5	7-Oct-1993	2313Z
3798.9	OZ1ING	7-Oct-1993	2258Z
3791.0	9V1XQ	7-Oct-1993	2234Z
3799.4	P29VH	7-Oct-1993	1044Z
3799.6	OY9JD	7-Oct-1993	0436Z
3507.3	3DA0BK	7-Oct-1993	0443Z
3799.5	OY9JD	7-Oct-1993	0409Z
3507.0	3DA0BK	7-Oct-1993	0351Z
3799.0	PY0ZFB	7-Oct-1993	0317Z
3799.0	PY0FF	7-Oct-1993	0256Z
3799.3	CN8JC	6-Oct-1993	2338Z
3799.0	V85PB	6-Oct-1993	1316Z
3799.0	**SV8JB**	**4-Oct-1993**	**0502Z**

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7010.1	8R1J	18-Oct-1993	1018Z
7005.2	FS/JL1MUT	18-Oct-1993	1015Z
7009.5	9J2BO	18-Oct-1993	0416Z
7005.9	ZA1J	18-Oct-1993	0338Z
7003.9	OM3YL	18-Oct-1993	0325Z
7003.0	ZA1J	18-Oct-1993	0312Z
7007.4	T77C	18-Oct-1993	0250Z
7003.3	JW4WIA	18-Oct-1993	0245Z
7003.7	TU2MA	18-Oct-1993	0231Z
7007.4	T97C	18-Oct-1993	0243Z
7007.6	JW4WIA	18-Oct-1993	0234Z
7017.1	FS/JG1RXQ	18-Oct-1993	0222Z
7012.6	SP0KEH	18-Oct-1993	0224Z
7009.0	PZ1DV	18-Oct-1993	0147Z
7003.8	TU2MA	18-Oct-1993	0144Z
7011.1	LZ1JZ	18-Oct-1993	0126Z
7015.0	S51DQ	18-Oct-1993	0102Z
7004.4	UC2LER	17-Oct-1993	2254Z
7000.5	P39ADA	17-Oct-1993	2017Z
7006.4	JW4WIA	17-Oct-1993	1959Z
7024.5	V73C	17-Oct-1993	1146Z
7005.0	VS6WV	17-Oct-1993	1120Z
7005.1	EA6NB	17-Oct-1993	0556Z
7016.0	KH6RS	17-Oct-1993	0531Z
7003.7	SV1AOZ	17-Oct-1993	0443Z
7025.0	SV1MF/J	17-Oct-1993	0435Z
7023.0	5Z4FO	17-Oct-1993	0259Z
7075.0	V31ML	17-Oct-1993	0020Z
7006.4	U35UV	17-Oct-1993	0012Z
7012.2	UR8J	17-Oct-1993	0032Z
7001.5	HL1EX	16-Oct-1993	2213Z
7016.0	5R8DG	16-Oct-1993	1444Z
7003.0	BY1QH	16-Oct-1993	1350Z
7013.6	JW9DFA	16-Oct-1993	0548Z
7004.0	OM3CQR	16-Oct-1993	0404Z
7015.7	JW4WIA	16-Oct-1993	0336Z
7024.5	JW0C	16-Oct-1993	0335Z
7003.8	TA3D	16-Oct-1993	0337Z
7003.0	FS/JG1RXQ	16-Oct-1993	0304Z
7012.0	5Z4FO	16-Oct-1993	0256Z
7015.8	JW4WIA	16-Oct-1993	0240Z
7001.8	ZD8VJ	16-Oct-1993	0206Z
7014.6	JW0E	16-Oct-1993	0043Z
7022.1	LX1KQ	15-Oct-1993	2337Z
7011.0	4K1D	15-Oct-1993	2326Z
7003.0	ZD9SXW	15-Oct-1993	2307Z
7002.0	JW4WIA	15-Oct-1993	0257Z
7006.6	HB0/HB9NL	15-Oct-1993	0230Z
7004.0	5Z4FO	15-Oct-1993	0211Z
7001.8	HZ1AB	15-Oct-1993	0201Z
7001.9	JW9DFA	14-Oct-1993	2357Z
7003.4	9K2ZZ	14-Oct-1993	2328Z
7010.0	4K1D	14-Oct-1993	2250Z
7001.9	DL8KWS/5B4	14-Oct-1993	2213Z
7001.0	A71CW	14-Oct-1993	2211Z
7060.0	TU5DX	14-Oct-1993	2208Z
7003.6	4U1ITU	14-Oct-1993	0228Z
7006.0	**5R8DG**	**14-Oct-1993**	**0255Z**
7017.5	LZ1LZ	14-Oct-1993	0132Z
7001.0	T97T	14-Oct-1993	0052Z
7002.0	9H3RJ	13-Oct-1993	2231Z
7008.8	OA4IWE	13-Oct-1993	1014Z
7004.5	5R8DG	12-Oct-1993	0325Z
7006.1	TR8MC	12-Oct-1993	0106Z
7005.4	JW0E	11-Oct-1993	2142Z
7009.0	HL1AVS	11-Oct-1993	1459Z
7004.4	3B8CF	11-Oct-1993	1341Z
7007.0	OA4AWE	11-Oct-1993	1112Z
7006.5	9J2BO	11-Oct-1993	0418Z
7009.8	7Q7LA	11-Oct-1993	0415Z
7003.3	SV1AKX	11-Oct-1993	0034Z
7007.2	A22MN	11-Oct-1993	0004Z
7032.6	J5UAI	10-Oct-1993	2311Z
7002.4	DL8KWS/5B4	10-Oct-1993	2141Z
7007.3	T92A	10-Oct-1993	2133Z
7003.0	HZ1AB	10-Oct-1993	1429Z
7012.8	BV4MK	10-Oct-1993	1339Z
7008.0	3D2AG/P	7-Oct-1993	1009Z